

# PATENT ABSTRACTS OF JAPAN

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(54) INK JET RECORDING MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an ink jet recording material capable of preventing blonzing (glare of a solid part) in an ink jet recording using particularly an aqueous ink and having good light resistance.

SOLUTION: In the ink jet recording material comprising an ink receiving layer containing a water soluble or hydrophilic resin, the layer contains a phenyl-5-benzotriazolecarboxylate.

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**Notes:**

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The ink jet recording material characterized by the thing which is chosen from among (h) from the following (a) all over said ink absorbing layer, and which contain the benzotriazol system compound more than a kind at least in the ink jet recording material which has the ink absorbing layer containing water solubility or hydrophilic resin.

- (a) phenyl 5-benzotriazol carboxylate (b) methyl 5-benzotriazol carboxylate (c) Phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) Carbamoyl]-1-naphthyl oxymethyl]-1H-benzotriazol 5-carboxylate (d) Phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) carbamoyl]-1-naphthyl OKISHIMECHI RU]-1H-benzotriazol 6-carboxylate (e) 5-benzotriazol carboxylic acid (f) Benzotriazol 5-carboxylic acid (g) 1-alkyloyl benzotriazol (however, the carbon number of alkyloyl is 8 to 24) (h) 1-ARUKE noil benzotriazol (however, the carbon number of ARUKE noil is 8 to 24)

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Field of the Invention] With respect to an ink jet recording material, in the ink-jet record using an aqueous ink, bronzing (a \*\* TA part glaring) can be prevented, and especially this invention relates to a light-fast good ink jet recording material.

**[0002]**

[Description of the Prior Art] Ink-jet record is the printing method which spread most along with electrophotography printing (PPC), and in order to obtain a good picture, the various proposals of the record material to which television treatment for exclusive use was performed are made. As for these ink jet recording materials, what applied the resin with which it was required that the absorptivity of an aqueous ink should have been well equipped with a water resisting property, and it was equipped with such performance on the paper used as a base material or a film is common. Some devices for furthermore raising the fixability of the ink after printing and gloss are also proposed (JP,H1-295879,A etc.).

[0003] For example, at the charge for ink-jets of a recorded material indicated to JP,H1-295879,A, the fixability of ink, a water resisting property, and lightfastness are raised by processing paper, cloth, etc. in weak alkali salt aqueous solutions, such as sodium carbonate and sodium phosphate, (dipping, a spray, etc.).

**[0004]**

[Problem(s) to be Solved by the Invention] On the other hand, although black printing is formed by piling up ink, such as magenta, yellow, and cyanogen, in printing by ink-jet record, for example, the phenomenon called what is called bronzing in which such a \*\* TA part glares in a bronze color poses a problem.

[0005] the foramen with which this bronzing consists of inorganic pigments, such as alumina, and a

little binders -- although it seldom becomes a problem in an ink jet recording material with an absorbed type ink absorbing layer, water soluble resin cannot fully be prevented with the resin swelling type ink jet recording material used as a principal component.

[0006] In order to prevent this bronzing, it can consider making an ink absorbing layer contain a cationic additive, but if it does in this way, although bronzing can be prevented, the lightfastness of the color used for ink will fall.

[0007] Then, this invention aims at preventing bronzing, without reducing the lightfastness of a color in an ink jet recording material.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose [ the ink jet recording material of this invention ] In the ink jet recording material which has the ink absorbing layer containing water solubility or hydrophilic resin, it is the thing which is chosen from the following (a) from the inside of (h) all over an ink absorbing layer and which contains the benzotriazol system compound more than a kind at least.

[0009] (a) phenyl 5-benzotriazol carboxylate (b) methyl 5-benzotriazol carboxylate (c) Phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) Carbamoyl]-1-naphthyl oxymethyl]-1H-benzotriazol 5-carboxylate (d) Phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) carbamoyl]-1-naphthyl OKISHIMECHI RU]-1H-benzotriazol 6-carboxylate (e) 5-benzotriazol carboxylic acid (f) Benzotriazol 5-carboxylic acid (g) 1-alkyloyl benzotriazol (however, the carbon number of alkyloyl is 8 to 24) (h) 1-ARUKE noil benzotriazol (however, the carbon number of ARUKE noil is 8 to 24)

[0010]

[Embodiment of the Invention] The form of operation of the ink jet recording material of this invention is explained hereafter.

[0011] Generally as the water solubility which constitutes an ink absorbing layer, or hydrophilic resin, resin for the ink absorbing layers of an ink jet recording material is used. The resin which especially the absorptivity of basin system ink is good, and has a water resisting property is used suitably. As such resin, polyvinyl alcohol, polyvinyl pyrrolidone, Water-soluble cellulosic resin, water-soluble polyester resin, polyvinyl acetal, Polyacrylic acid, an acrylic ester copolymer, an acrylamide copolymer, Natural resins, such as synthetic resins, such as a melamine resin, polyether polyol, or its bridge formation thing, and these denaturation things, gelatin, casein, starch, chitin, and chitosan, and these denaturation things, the water soluble polymers water-resistance-ized moderately if needed, and these denaturation things are mentioned. Moreover, the compound which stiffened water soluble resin, such as polyvinyl alcohol and polyvinyl pyrrolidone, by the well-known method, the resin which has a cinnamoyl machine, a still BAZORIUMU machine, a styryl KINORIUMU machine, or a diazo group by water solubility, etc. can be used. These resin can mix one sort or two sorts or more, and can be used.

[0012] Next, a specific benzotriazol system compound is contained in an ink absorbing layer. As a benzotriazol system compound, (a) phenyl 5-benzotriazol carboxylate, (b) Methyl 5-benzotriazol carboxylate and (c) phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) carbamoyl]-1-naphthyl oxymethyl]-1H-benzotriazol 5-carboxylate, (d) Phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) carbamoyl]-1-naphthyl oxymethyl]-1H-benzotriazol 6-carboxylate, (e) 5-benzotriazol carboxylic acid, (f) benzotriazol 5-carboxylic acid, (g) 1-alkyloyl benzotriazol (however, the carbon number of alkyloyl is 8 to 24), (h) 1-ARUKE noil benzotriazol (however, the carbon number of ARUKE noil is 8 to 24), and \*\*\*\*\* -- these -- contain more than a kind at least.

[0013] It becomes possible to prevent bronzing by containing such a specific benzotriazol system compound, without reducing the lightfastness of a color. As this Reason, while these substances are cationicity, it is thought that it is because it has ultraviolet absorption ability, but such an effect is not acquired even if it makes the cationic benzotriazol system ultraviolet ray absorbent generally used contain. Therefore, although it seems that there is a big factor in addition to this Reason, at present, it is not clear.

[0014] Moreover, the effect that fixing (dyeing property) of the color in ink becomes good also does so by containing a specific benzotriazol system compound. These effects are remarkable especially when ink is acid ink.

[0015] 0.1- of the whole water solubility or hydrophilic resin with which the amount of addition of a benzotriazol system compound constitutes an ink absorbing layer -- it is 2 to 15 weight % suitably 20weight %. Bronzing depressor effect can be obtained without dropping lightfastness by considering it as such a range. Moreover, ink receptiveness may be checked at 20 weight.% or more.

[0016] The others [ compound / water solubility or hydrophilic resin, and / specific / benzotriazol system ] which mentioned the ink absorbing layer above, Other inorganic pigments, such as Clay, a talc, a diatom earth, calcium carbonate, calcium sulfate, barium sulfate, aluminum silicate, titanium oxide, zinc oxide, silicon dioxide, permutite, alumina, and a smectite, can be contained. By adding an inorganic pigment, the absorptivity of ink can be raised and blocking can be prevented. The amount of addition of these inorganic pigments is made into a 5 - 200 weight part grade to resin 100. Furthermore, you may add additives, such as a defoaming agent, a leveling agent, light stabilizer, and a pigment, if needed.

[0017] Dissolve or distribute to a solvent and an ink absorbing layer makes a coating slip the inorganic pigment and additive which are used if needed [ the water solubility or hydrophilic resin, the specific benzotriazol system compound, and if needed ] which were mentioned above. It can form applying and drying this on a base material by the spreading methods, such as the BAKOTINGU method, a spray coating method, and the roll coating method. Although the thickness in particular of a paint film is not limited, it shall usually be 3 micrometers - 20 micrometers suitably 1 micrometer - 50 micrometers.

[0018] A film transparent or opaque as a base material, for example, polyester, Polycarbonate, polyethylene, polypropylene, triacetyl cellulose, The complex film of synthetic resin films, such as polyvinyl chloride, an acrylic, polystyrene, polyamide, polyimide, and a vinylidene chloride vinyl chloride copolymer, paper or paper, and said synthetic resin film etc. can be used.

[0019] On the surface of the base material, surface treatments, such as easily-adhesive treatment, may be made so that it may be easy to form an ink absorbing layer. Moreover, a base material may be a multilayer object with which layers, such as an adhesive layer and a writing layer, were laminated for the \*\* arrival to other members, and a note and the other purposes. Although the thickness in particular of a base material is not limited, a 20-200-micrometer thing is used in consideration of supply to an inkjet printer, conveyance, etc.

[0020] Moreover, in the ink jet recording material of this invention, an ink absorbing layer may be a lamina or may be a multilayer. For example, by laminating several ink absorbing layers which changed the kind and content of the kind of water soluble resin, or the pigment made to contain, improvement in the absorptivity and fixability of ink, and quality of image can be aimed at. In this case, the specific benzotriazol system compound mentioned above to the ink absorbing layer which turns into the outermost layer at least is made to contain. While being able to prevent bronzing effectively, without reducing the lightfastness of a color by this, dyeing property improves.

[0021] Although the ink in particular used for the ink jet recording material of this invention is not limited, when the aqueous ink in which colors, such as an acid dye, were made to dissolve is used into water and/or a water-soluble organic solvent, the effect of this invention is demonstrated.

[0022]

[Example] The following examples explain this invention still in detail.

[0023] On the polyethylene terephthalate film with examples 1-8 and a comparative example [ 1 ] - a 2 thickness of about 100 micrometers, the coating liquid for ink absorbing layers of the following presentation was applied by bar coating, and the ink absorbing layer with an after-desiccation thickness of about 10 micrometers was formed.

[0024] A presentation and polyvinyl pyrrolidone of the coating liquid for ink absorbing layers (K-90:GAF) Ten weight parts and silica particle 0.5 weight part (SAIRISHIA 335: Fuji SHIRISHIA

chemistry company)

- Benzotriazol system compound One weight part and water (only a comparative example 1 ethanol) 99 weight parts [0025] In addition, it is about a benzotriazol system compound, Example 1: Phenyl 5-benzotriazol carboxylate example 2: Methyl 5-benzotriazol carboxylate example 3: Phenyl 1-[4-hydroxy 3-[N- Carbamoyl] -1-naphthyl oxymethyl]-1H-benzotriazol 5-carboxylate example 4 : Phenyl 1-[4-hydroxy 3-[N-(2-tetradecyl oxy-phenyl) carbamoyl]-1-naphthyl OKISHIMECHI (2-tetradecyl oxy-phenyl) RU]-1H-benzotriazol 6-carboxylate example 5:5-benzotriazol carboxylic-acid example 6: Benzotriazol 5-carboxylic acid example 7:1-alkyloyl benzotriazol (however, the carbon number of alkyloyl 10)

Example 8:1-ARUKE noil benzotriazol (however, the carbon number of ARUKE noil 20)

Comparative example 1:2 -(2'- hydroxy5'-methylphenyl)- About a comparative example 2, a benzotriazol system compound was not put in using benzotriazol.

[0026] Thus, it printed by having used the inkjet printer (PM-750C: SEIKO EPSON company) for the produced ink jet recording material, and viewing estimated the existence of bronzing of a \*\*\*\* TA part. The result is shown in Table 1. In addition, in the inside of front "O", it is shown, respectively that bronzing was not seen at all and that "x" had deterioration of quality of image by bronzing.

[0027] Moreover, fade meter was used for the solid part of the magenta of the ink jet recording material printed similarly, and the exposure by a carbon arc was performed for 50 hours. For less than ten, \*\*E made "\*\*" "O" and less than [ 10 or more ] 30, made 30 or more "x", and lightfastness was evaluated. Furthermore, when 30 degrees C of ink jet recording materials printed similarly were saved under the environment of RH 90% for 24 hours, that in which a printing image area does not spread was made into "O", what it spreads and a picture is hard to check was made into "x", and it evaluated about dyeing property.

[0028]

[Table 1]

|       | ブロンジング | 耐光性 | 染着性 |
|-------|--------|-----|-----|
| 実施例 1 | ○      | ○   | ○   |
| 実施例 2 | ○      | ○   | ○   |
| 実施例 3 | ○      | ○   | ○   |
| 実施例 4 | ○      | ○   | ○   |
| 実施例 5 | ○      | ○   | ○   |
| 実施例 6 | ○      | ○   | ○   |
| 実施例 7 | ○      | ○   | ○   |
| 実施例 8 | ○      | ○   | ○   |
| 比較例 1 | ×      | ○   | ×   |
| 比較例 2 | ×      | ×   | ×   |

[0029] Bronzing was able to be controlled maintaining good [ lightfastness and dyeing property ] by adding a specific benzotriazol system compound to an ink absorbing layer so that clearly also from the result of Table 1. Moreover, although not shown in a table, good ink-jet recordability was acquired, without checking the characteristics (there not being ink absorbency, fixability, and a blot) of others required for an ink jet recording material etc. by adding a benzotriazol system compound.

[0030]

[Effect of the Invention] The ink jet recording material of this invention can control bronzing of a solid part effectively, maintaining lightfastness and dyeing property good by making an ink absorbing layer contain a specific benzotriazol system compound. Moreover, since a benzotriazol system compound is contained, the lightfastness of the paint film itself can improve, membranous after-yellowing and membranous chalking can be prevented, and weatherability of the whole material can be made high.

[Translation done.]